Roll No. .....

13078

Printed Pages : 3

MMS / D–17
BUSINESS STATISTICS
Paper–CP–102

Time allowed : 3 hours] *[Maximum marks : 70*

Note : *(i) Attempt any **eight** questions from **Part–A** carrying 5 marks each.*

*(ii) Also attempt any **three** questions from **Part–B** carrying 10 marks each.*

Part–A

1. The incidence of occupational disease in an industry is such that the workers have 20 per cent chance of suffering from it. What is the probability that out of six workers 4 or more will come in contact of disease ? 5

2. What are sampling and non-sampling errors ? How are these errors managed in the statistical decision-making. 5

3. State and describe desirable properties of good estimator. 5

4. The odds in favour of A solving a given problem are 6:9 and against B doing the same are 12:10. If A and B attempt to solve the problem independently, find the probability of the problem being solved. 5

5. Compare and contrast statistical mechanism underlying the large and the small sampling tests. 5

6. A wholeseller of eggs claims that only 4 per cent of the eggs supplied by him are defective A random sample of 600 eggs contained 36 defectives. Test the claim of the wholeseller. 5

7. A stock broker is interested to know whether the daily movement of a particular share price averages in the stock market showed a pattern of movement or these movements were purely random. For 14 business days, he noted the value of this average and compared it with the value at the close of the previous day. He noted the increase as plus (+) and decrease as minus (–). The record was as follows :

+, +, –, –, +, +, +, –, +, +, –, +, –, –.

Test whether the distribution of these movements is random or not at $\alpha = 0.05$ level of significance. 5

8. Identify and describe the causes of variations in statistical quality characteristics. 5

9. What is Central Limit Theorem ? Describe its significance in statistical theory. 5

10. Write a brief note on the Acceptance sampling. 5

Part–B

11. In a bolt factory, machines A, B and C manufacture 25%, 35% and 40 per cent of the total output respectively. Of the total of their output, 5, 4 and 2 per cent are defective bolts. A bolt is drawn at random and is found to be defective. What is the probability that it was manufactured by machines A, B and C ? 10

12. In a normal distribution 31 per cent of the items are under 45 and 8 per cent are over 64. Find the mean and standard deviation of the distribution. 10

13. What is random sampling ? Briefly describe random sampling methods. 10

14. A machine is set to deliver an item of a given weight. 10 samples of size 5 each were recorded and are reported below :

Samples	1	2	3	4	5	6	7	8	9	10
Mean ($\bar{x}$)	15	17	15	18	17	14	18	15	17	16
Range (R)	7	7	4	9	8	7	12	4	11	5

Calculate the values for the central line and the control limits for mean chart and the range chart and then comment on the state of control. (Conversion factors for n = 5 are ; $A_2 = 0.58$, $D_3 = 0$, $D_4 = 2.115$). 10

15. Write notes on the following :

(a) Type I and Type II errors

(b) Microsoft Excel Analytics. 5+5=10